PUBLIC HEALTH REFERENCE SHEET
Trypanosomiasis

Name	Common name: African trypanosomiasis (Sleeping sickness) American trypanosomiasis (Chagas disease) Causative Agent: African trypanosomiasis: *Trypanosoma brucei* (*T. b. rhodesiense* and *T. b. gambiense*) American trypanosomiasis: *Trypanosoma cruzi*
Reservoir & Transmission	*T. b. rhodesiense*: wild and domestic animals, cattle *T. b. gambiense*: humans, domestic, and wild animals *T. cruzi*: armadillos, opossums, raccoons, woodrats, some other rodents, domestic dogs African trypanosomiasis: bite from tsetse fly (*Glossina species*) American trypanosomiasis: infected feces from triatomine (*Reduviidae*) bugs (kissing bugs) through conjunctivae, mucous membranes, or skin wounds
Incubation Period	African trypanosomiasis: within 3 days to a few weeks American trypanosomiasis: acute disease immediately after infection; 5–14 days after bite, or 30–40 days after blood transfusion
Common Symptoms	African trypanosomiasis: painful chancre, fever, intense headache, insomnia, painless swollen lymph nodes, anemia, local edema, rash American trypanosomiasis: fever, malaise, hepatosplenomegaly, and swollen lymph nodes
Gold Standard Diagnostic Test	African trypanosomiasis: microscopy American trypanosomiasis: microscopy, antibody testing
Risk Groups	All susceptible
Geographic Significance	African trypanosomiasis: Most common in rural sub-Saharan Africa American trypanosomiasis: Most common in Mexico, Central America, and South America

What is trypanosomiasis?

Trypanosomiasis is a parasitic infection caused by the *Trypanosoma* species. There are two types of trypanosomiasis infections: African trypanosomiasis, also known as sleeping sickness, is caused by microscopic parasites of the species *Trypanosoma brucei*, and American trypanosomiasis, also known as Chagas disease, is caused by the parasite *Trypanosoma cruzi*.

What is the occurrence of trypanosomiasis?

- African trypanosomiasis is endemic to rural sub-Saharan Africa. *T. brucei rhodesiense* is reported from eastern and southeastern Africa, mainly Malawi, Tanzania, Uganda, Zambia, and Zimbabwe. *T. brucei gambiense* is reported from central and west Africa, particularly in parts of the Democratic Republic of the Congo, as well as Angola, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, South Sudan, (northern) Uganda, and other countries.
- *T. cruzi* is endemic to many parts of Mexico and Central and South America; rare locally acquired American trypanosomiasis cases have been reported in the southern United States. No vectorborne transmission has been documented in the Caribbean islands. In the United States, American trypanosomiasis is primarily a disease of immigrants from endemic areas of Latin America.

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How is trypanosomiasis transmitted?

- African trypanosomiasis is transmitted by the bite of an infected tsetse fly (*Glossina spp*.), which is found only in sub-Saharan Africa. Bloodborne, congenital, sexual, and transfusion or transplantation transmission are rare.
- American trypanosomiasis infection in humans occur when *T. cruzi* in the feces of an infected triatomine insect (reduviid bug/kissing bug) enters the body. Entry portals include breaks in the skin (e.g., at the site of a reduviid bug bite), through the eyes by touching or rubbing with contaminated fingers, and through the gastrointestinal tract by consuming contaminated food or beverages. *T. cruzi* also can be transmitted through blood transfusions, organ transplantation, and vertically, from mother to infant (CDC, 2023).

Who is at risk for trypanosomiasis?

- The risk for African trypanosomiasis is minimal to travelers to urban areas, although transmission has been observed in some urban settings in the past. Tsetse flies bite during the day, and <1% are infected. Risk for infection in travelers increases with the number of fly bites, which does not always correlate with duration of travel. People most likely to be exposed to African trypanosomiasis infection are hunters and villagers with infected cattle herds. Tourists and other people working in or visiting game parks are at risk for contracting African trypanosomiasis if they spend long periods in rural areas where the disease is present.
- The risk for American trypanosomiasis is higher to immigrants and refugees from endemic areas and long-term travelers to endemic areas.

What are the signs and symptoms of trypanosomiasis?

- African Trypanosomiasis: In the early stages of infection, there may be a painful chancre, which originates as a papule and evolves into a nodule at the site of the tsetse fly bite. There may be fever, intense headache, insomnia, painless swollen lymph nodes, anemia, local edema, or rash. In the later stages, there may be cachexia, central nervous system dysfunction, or somnolence (hence the name “sleeping sickness”). The disease may run a protracted course of several years in the case of *T. b. gambiense*. In cases of *T. b. rhodesiense*, the disease has a rapid and acute evolution. Disease caused by either species is always fatal without treatment.
- Acute American Trypanosomiasis: Acute disease occurs immediately after infection and may last up to a few weeks or months. Infections may be mild or asymptomatic. If symptoms do develop, they are typically mild or nonspecific, and include fever, malaise, or hepatosplenomegaly. An inflammatory response at the infection site (chagoma) may last several weeks.
- Chronic American Trypanosomiasis: Most infected people enter a prolonged asymptomatic form of disease (chronic indeterminate) following the acute phase. Many remain asymptomatic for life. Approximately 20–30% of chronic American trypanosomiasis cases develop severe symptoms including cardiovascular complications (heart rhythm abnormalities, dilated heart) or gastrointestinal complications (dilated esophagus or colon, leading to difficulties eating or passing stool).

How is trypanosomiasis diagnosed?

- Tsetse fly bites are characteristically painful, and a chancre can develop at the bite location. No serologic tests for *T. brucei* are available in the United States. Diagnosis of *T. b. rhodesiense* is made by microscopic identification of parasites in specimens of blood,

chancre fluid, or tissue; cerebrospinal fluid (CSF); bone marrow aspirates; or lymph node aspirates. The level of parasitemia is lower in *T. b. gambiense* than *T. b. rhodesiense* infections. Microscopic identification generally requires serial examinations of samples concentrated by techniques, such as centrifugation followed by buffy coat examination, microhematocrit centrifugation, or mini-anion exchange centrifugation. All patients diagnosed with African trypanosomiasis must have their CSF examined on a wet preparation to look for motile trypomastigotes and white blood cells (WBC) checked to determine whether the CNS is involved; the choice of treatment drugs depends on the disease stage. Patients with ≤5 WBC/mL and no trypomastigotes in CSF are in the first stage, and those with >5 WBC/mL or trypomastigotes in CSF are in the second stage (CDC, 2023).

- During the acute phase, parasites can be detected in fresh preparations of buffy coat or stained peripheral blood specimens; PCR testing also can help detect acute infection. After the acute phase, diagnosis requires ≥2 serologic tests to detect *T. cruzi*–specific antibodies, most commonly ELISA, immunoblot, and immunofluorescent antibody test. PCR is not a useful diagnostic test for chronic-phase infections because parasites cannot be detected in the peripheral blood during this phase.

How is trypanosomiasis treated?

- Treat people diagnosed with African trypanosomiasis with a drug course specific to the type of infection (*T. b. rhodesiense* or *T. b. gambiense*) and disease stage (i.e., presence or absence of CNS involvement). Pentamidine, the recommended treatment for first-stage *T. b. gambiense* infection, is available in the United States. Nifurtimox was approved by the U.S. Food and Drug Administration (FDA) in August 2020 and is commercially available. No test of cure is available for African trypanosomiasis. After treatment, closely follow patients for 24 months and monitor for relapse. Recurrence of symptoms will require examination of body fluids, including CSF, to detect the presence of trypanosomes (CDC, 2023).
- Antitrypanosomal drug treatment is always recommended for acute, early congenital, and reactivated *T. cruzi* infection, as well as for chronic *T. cruzi* infection in children <18 years old. In adults with chronic infection, treatment is usually recommended. The two drugs used to treat American trypanosomiasis are benznidazole and nifurtimox. Benznidazole is approved by the FDA for use in children 2–12 years old and is commercially available. Nifurtimox is approved by the FDA for treatment of children from birth to <18 years old who weigh at least 2.5 kg. The drug was approved in August 2020 and became commercially available later that year (CDC, 2023).

How can trypanosomiasis be prevented?

- No vaccines or prophylactic drugs against African trypanosomiasis are available. To reduce the risk for infection, people should minimize contact with tsetse flies by wearing long-sleeved shirts and long pants made of medium-weight fabric in neutral colors. Tsetse flies are attracted to bright or dark colors, especially blue and black, and can bite through lightweight clothing. People should inspect vehicles before entering because the flies are attracted to the motion and dust from moving vehicles, and they should avoid bushes because tsetse flies are less active during the hottest part of the day but will bite if disturbed. Although permethrin-impregnated clothing and insect repellent have not proven to be particularly effective against tsetse flies, people should use DEET repellent to prevent other insect bites that can cause illness.
- To avoid American trypanosomiasis, people should follow insect bite precautions and food and water precautions. People also should avoid sleeping in adobe, mud, or thatch housing

in endemic areas, and use insecticides in and around such homes. Insecticide-treated bed nets are helpful. Screening blood and organs for American trypanosomiasis prevents transmission via transfusion or transplantation. Screening of pregnant people coming from endemic areas and early detection and treatment of mother-to-baby (congenital) cases also will help reduce disease burden.

What are some Public Health considerations?

- When reporting cases of trypanosomiasis in the Disease Reporting System Internet (DRSi), specify the form of disease, document relevant travel and deployment history occurring within the incubation period, and specify whether the patient presented with congenital disease.

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